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| 10/552,820 | 10/11/2005 | Bernhard Gleich | DE 030115 | 5543 |

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| EXAMINER |
|---|
| MEHTA, PARIKHA SOLANKI |

| ART UNIT | PAPER NUMBER |
|---|---|
| 3737 | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/552,820 | GLEICH, BERNHARD | |
| | Examiner | Art Unit | |
| | PARIKHA S. MEHTA | 3737 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *06 August 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *2-18,20-22 and 25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-18,20-22 and 25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 2-9, 11-13, 16-18, 22 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tournier et al (US PG Pubs. No. 2002/0168321), hereinafter Tournier ('321) in view of Kreuwel et al (US Patent No. 6,764,859), hereinafter Kreuwel ('859).

**Regarding claims 2, 4, 5, 7, 22 and 25**, Tournier ('321) teaches an MR system and diagnostic method including means and steps for generating an imaging magnetic field over an examination area such that the area comprises one sub-area subjected to a lower magnetic field strength and a second sub-area subjected to a higher magnetic field strength, acquiring signals that depend o the magnetization in the examination area, and evaluating the signals to determine the spatial distribution of magnetic particles in the examination area (¶ 10, 26, 35).

Tournier ('321) does not teach changing the spatial location of the sub-areas, nor does Tournier ('321) teach that the magnetic particles are exposed to a varying magnetic field. In the same field of endeavor, Kreuwel ('859) teaches subjection of magnetic particles to a varying magnetic field, wherein the field is reversed (i.e., oscillated, such that the relative position of the examination area changes relative to the magnetic field) within a sub-area and thus inherently experiences a zero crossing therein, wherein the field is inherently applied in three dimensions and locally restricted, in order to prevent agglomeration of magnetic and superparamagnetic particles (Abstract, col. 2 lines 21-32, col. 2 line 61-col. 3 line 4, col. 3 lines 23-30, claims 1-4). It would have been obvious to one of ordinary skill in the art at the time of invention to have modified Tournier ('321) to include the spatial location changing and varying magnetic field application steps and means of Kreuwel ('859) and thereby achieve the claimed invention, in order to prevent agglomeration of the magnetic particles according to the teachings of Kreuwel ('859).

**Regarding claim 3**, Tournier ('321) teaches application of a gradient field (¶ 2).

**Regarding claim 6**, Tournier (‘321) teaches the particles as having an average size or expansion of at least 30 nm (¶ 35).

**Regarding claims 8, 9 and 12**, neither Tournier ('321) nor Kreuwel (‘859) expressly teach specific values for the varying field strength, power or frequency. However, it would have been obvious to one of ordinary skill in the art at the time of invention to have used a magnetic field of the claimed parameter values, as it has previously been held that, where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges is obvious and unpatentable (*In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955)).

**Regarding claim 11**, Tournier (‘321) teaches that the particles comprise a magnetic core and nonmagnetic coating (¶ 19 and 49).

**Regarding claim 13**, all magnetic fields, including the varying field taught by Kreuwel (‘859), inherently comprise at least one pulse that decays to zero.

**Regarding claim 16**, neither Tournier (‘321) nor Kreuwel (‘859) expressly teach deagglomeration (i.e. application of the varying magnetic field to the particles) prior to administering the magnetic particles to the examination area. However, a skilled artisan would have found it to be an obvious matter of common sense to try to deagglomerate the particles prior to administration, in order to prevent having to separate them after they are dispersed within the subject to be imaged.

**Regarding claim 17**, neither Tournier (‘321) nor Kreuwel (‘859) teach application of the varying field and, thus, the deagglomeration of the magnetic particles, after the particles are administered to the examination area, or that the varying field is only applied to a part of the examination area. However, one of ordinary skill in the art would have considered it nothing more than an obvious matter of common sense to apply the varying field after administration in order to maximize the effects of deagglomeration during imaging, and to only expose the area to be imaged (i.e., a part of the examination area) to such field, as exposing more of the area would not be useful (*KSR International Co. v. Teleflex Inc*, 82 USPQ2d 1385).

**Regarding claim 18**, the obviousness of the claimed frequency range has previously been discussed for claims 8, 9 and 12. Furthermore, a skilled artisan would have considered it nothing more than an obvious matter of common sense to alternate the imaging and varying fields of Tournier (‘321) and Kreuwel (‘859), in order to prevent the signal of the varying field from interfering the imaging field (*KSR International Co. v. Teleflex Inc*, 82 USPQ2d 1385).

3. Claims 10, 14, 15 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tournier (‘321) and Kreuwel (‘859) as applied to claim 2 above, and further in view of Ivkov (US PG Pubs. No. 2006/0142749), hereinafter Ivkov (‘749), of record.

Tournier (‘321) and Kreuwel (‘859) do not teach the particles to be monodomain particles, nor do they teach that the varying magnetic field is chosen in view of the viscosity of the liquid medium in which the particles are dispersed. In the same problem solving area, Ivkov ('749) teaches a method of administering to a patient a solution of magnetic particles wherein monodomain magnetic contrast particles are dispersed in blood, the monodomain particles being configured to be reverse magnetized by Neel rotation, and wherein the frequency of the varying magnetic field is chosen in view of the viscosity of blood (¶ 15, 16, 22, 27, 63-64). It would have been obvious to one of ordinary skill in the art at the time of invention to have modified Tournier ('321) and Kreuwel (‘859) to include the steps of Ivkov ('749) and thereby achieve the claimed invention, as such a modification requires nothing more than the mere combination of known prior art steps to yield predictable results, which has previously been held as obvious and unpatentable (*KSR International Co. v. Teleflex Inc*, 82 USPQ2d 1385).

4. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tournier (‘321) and Kreuwel (‘859) as applied to claim 2 above, and further in view of Rand (US PG Pubs. No. 2005/0066961), hereinafter Rand (‘961), of record.

Neither Tournier (‘321) nor Kreuwel (‘859) teach the magnetic particle to be a hard or soft multi-domain particle. In the same field of endeavor, Rand ('961) teaches an MR contrast imaging method wherein the magnetic particle is a hard or soft magnetic multi-domain particle. It would have been obvious to one of ordinary skill in the art at the time of invention to have modified the method of Tournier ('321) and Kreuwel (‘859) to employ the particle of Rand ('961), as such a substitution would require nothing more than the mere combination of known prior art elements and steps to yield predictable results, which has previously been held as obvious and unpatentable (*KSR International Co. v. Teleflex Inc*, 82 USPQ2d 1385).

***Response to Amendments and Arguments***

5. Applicant’s amendments are sufficient to overcome the previous objection and rejection under 35 U.S.C. 102(a), which are hereby vacated accordingly.

6. Applicant's arguments regarding the previous rejection sunder 35 U.S.C. 103(a), filed 6 August 2010, have been fully considered but are unpersuasive.

Applicant argues that Tournier ('321) and Kreuwel ('859) were improperly combined because the rejection failed to provide "an articulated reasoning with some rational underpinning" as to why a skilled artisan would modify Tournier ('321) to include the features of Kreuwel ('859) (Remarks p. 10). Examiner notes that it was well known in the art at the time of invention that magnetic particle contrast agents suffer from undesirable clumping and agglomeration (see for example US Patent No. 4,849,210, made of record by Applicant, at col. 3 lines 8-12). Accordingly, a skilled artisan would be reasonably motivated to try to solve this well known problem by modifying Tournier ('321), who is expressly directed towards magnetic particle contrast MRI, to include the separation steps and elements of Kreuwel ('859), clearly directed towards combating agglomeration of magnetic particles.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning (Remarks p. 11), it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Applicant also argues that Tournier ('321) and Kreuwel ('859) fail to sufficiently teach varying the spatial location of the first and second sub-areas and provide that a gradient of the first field reverses direction and experiences a zero crossing (Remarks p. 11). Examiner notes that these features were shown to be taught by Kreuwel ('859) as discussed in the third paragraph of the prior art rejection of 3 June 2010, which is also reiterated herein.

With specific regards to claim 22, Applicant provides little detail in the disclosure as to what is set forth, assuming invocation of 35 U.S.C. 112, 6th paragraph, by "means for generating". Applicant merely discloses the means as comprising a "gradient coil arrangement" (Specification p. 6 line 20). Accordingly, since the prior art includes a gradient coil arrangement as further discussed in the rejection, it meets the claim.

As Applicant's arguments are wholly unpersuasive for at least the foregoing reasons, the previous rejection of claims 2-18, 20-22 and 25 under 35 U.S.C. 103(a) is maintained and reiterated herein.

***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PARIKHA S. MEHTA whose telephone number is (571)272-3248. The examiner can normally be reached on M-F, 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571.272.4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/BRIAN CASLER/
Supervisory Patent Examiner, Art Unit 3737

/Parikha S Mehta/

Examiner, Art Unit 3737